

**ABSTRACT**

The systems of the present invention provide improved accuracy in monitoring, analysing, detecting, predicting and/or providing alerts and alarms associated  
5 with depth of anaesthesia, depth of consciousness, hypnotic state, sedation depth, fatigue or vigilance of a subject, with as few as 3 surface electrodes. The systems incorporate real-time phase, amplitude and frequency analysis of a subject's electro-encephalogram. The systems weight outputs of various types of analyses to produce an integrated analysis or display for precise  
10 indication or alert to users of the systems including anaesthetists, nurses and other medical personnel, transport drivers and machine workers. The systems weight the outputs of one or more analysis algorithms including combinations of simultaneous, real-time R&K analysis, AEP spectral analysis-SEF-MF, Bi-coherence analysis, initial wave analysis, auditory response, arousal analysis,  
15 body movement analysis, 95% spectral edge analysis and anaesthetic phase and spectral energy variance measurement in association with a subject's state of consciousness.